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AUTHOR Heistad, David; Reynolds, Maynard C.
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ABSTRACT

Twenty/twenty (20/20) Analysis is an outcomes-based approach to identifying and serving students at the margins of education. The analysis focuses on one or more important outcomes of education and looks to the marginal students, the top fifth of achievers (80th percentile) and the lowest fifth (20th percentile). It is based on the belief that schools that serve marginal students well will serve all students well. The Minneapolis Public Schools (Minnesota) became involved in 20/20 at the invitation of the National Center on Education in Inner Cities in 1991. Two Minneapolis elementary schools volunteered to participate in a study of the effectiveness of 20/20. At the Michael Dowling Elementary School, the initial data analysis and discussion were followed by cross-categorical restructuring of services for students identified through 20/20. This paper provides details and followup about Dowling's implementation of 20/20. It is organized into four sections: (1) an example of building-based 20/20 at Dowling; (2) a summary of statistics describing services for all Minneapolis public schools; (3) an explanation of graphs of continuous progress; and (4) a discussion of the implications and uses of 20/20. Three appendixes present graphs of reading achievement for different grade levels. (Contains 6 tables, 60 figures, and 5 references.) (SLD)

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20/20: A Closer Look at Students in Minneapolis Public Elementary Schools

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The National Center on Education in the Inner Cities

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The National Center on
Education in the Inner Cities

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20/20:

A Closer Look at Students at the Margins in Minneapolis Public Elementary Schools

David Heistad
Minneapolis Public Schools

and

Maynard C. Reynolds
University of Minnesota
and
The National Center on Education in the Inner Cities
Temple University

Introduction

The creators of 20/20 Analysis (also referred to herein as "20/20") propose that schools give special attention to students who demonstrate the least and most progress in basic academic subjects. This analysis focuses on one or more important outcomes of education and looks to the margins to identify students for whom the existing instructional program is working least and most adequately. It is based on the belief that schools that serve "marginal" pupils well will serve all students well (Reynolds, Zetlin, & Wang, 1993).

20/20 is an outcomes-based approach to identifying and serving students at the margins and thus challenges the traditional programmatic divisions of narrowly framed categorical programs. These traditional categories of student classification were established on the basis of presumed causes of learning problems that have been found to have very little relevance to instruction. As Reynolds and Zetlin (1993) note, "[20/20] proposes that instead of organizing programs by categories based on presumed causes, schools proceed directly to outcome measures and to very intensive instruction for children whose progress in learning under ordinary arrangements is marginal" (p. 3).

Minneapolis Public Schools (MPS) became involved in 20/20 at the invitation of Margaret C. Wang of the National Center on Education in the Inner Cities (CEIC) at Temple University. Associate Superintendent for Research and Development, Jan Witthuhn, invited all interested MPS principals to a 20/20 presentation by Wang and Maynard C. Reynolds on February 20, 1991. Following this presentation, Dowling and Lincoln Elementary Schools volunteered to participate in a study on the effectiveness of 20/20. A 3-year collaborative effort among categorical service delivery staff, parents, administrators, and research personnel ensued. Data were gathered from central computer files and individual school records compiled according to the designs of the school staff. At Dowling, the initial data analysis and discussion were followed by cross-categorical restructuring of services for students identified through 20/20.

Staff from Dowling decided to concentrate efforts on maximizing achievement based on the results of an analysis of the use of time by students and staff. As part of this analysis, they recommended that the time and effort devoted to categorical labeling as required by State of Minnesota special education eligibility rules could be better spent in serving all students identified through 20/20 in a low-cost, noncategorical or cross-categorical model. Following discussions with parents and teachers, a draft of a "waiver for performance" was presented by Dowling's principal, Jeff Raison, to Gary Warrington, head of the MPS Special Education Department. Mr. Warrington enthusiastically supported the request for a noncategorical waiver to the Minnesota Department of Education and proposed district-wide exception from state rules governing eligibility on learning disabilities and mild mental handicaps. This experimental proposal, approved in November 1993 by the Minnesota State Board of Education, highlights the 20/20 method in its "annual evaluation methods" section. The data included in each section of the following report serve as the baseline for monitoring the effects of the problem-solving method proposed here as an alternative to state eligibility rules.

This paper provides additional detail and follow-up regarding Dowling's implementation of 20/20, as well as district-wide utilization of 20/20 in Minneapolis. It is organized into four sections: (I) an example of building-based 20/20 conducted at Dowling Elementary School; (II) a summary of statistics describing demographic and cross-categorical services for all MPS elementary schools; (III) an explanation of continuous progress graphs (see Appendices A, B, and C) which illustrate the 20/20 approach to describing student progress in reading; and (IV) a discussion of 20/20's implications and possible uses.

I. 20/20 at Michael Dowling Elementary School

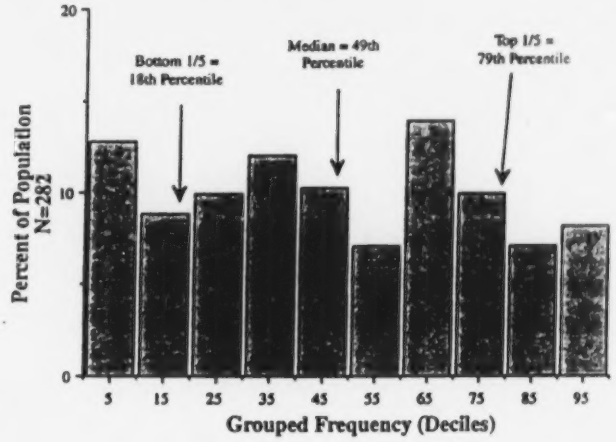
Obtaining Achievement Measures

The first step in implementing 20/20 at Dowling was to define the outcomes of student learning on which 20/20 would be conducted. The Dowling staff decided to focus initial analysis on reading and mathematics. They opted to limit the analysis to scores for reading comprehension rather than vocabulary and word-attack skills. Similarly, measures of math facts computation were of less interest to the Dowling faculty than measures of quantitative concepts and applications. A problem arose in that students' test score data on the achievement measure utilized in this study, the California Achievement Test (CAT), were available only for certain grade levels each year. Students who were enrolled as sixth graders in Fall 1991 were not tested on the CAT in Spring 1991 (i.e., as fifth graders), so it was necessary to use their fourth-grade scores from 1990.

CAT domain scores for reading comprehension and math concepts/applications were then downloaded from the UNISYS mainframe for all students enrolled at Dowling as of October 1991. The reading comprehension and math concepts/applications scores from Spring 1991 were placed in rank order. It was then possible to find the point separating the bottom fifth (i.e., the 20th-percentile) and the top fifth (i.e., the 80th percentile) of the distribution.

For reading comprehension, the Dowling distribution closely resembled national norms but was, in fact, slightly below national norms at the 20th, 50th, and 80th percentiles in the total school distribution. The score which delineated the bottom fifth of all Dowling students who took the test corresponded to the 18th percentile on national norms, while the median score and the score needed to place in the top fifth of the Dowling distribution corresponded to the 49th and 79th national percentiles, respectively. The complete distribution of Dowling reading comprehension scores for 1991 is presented in Figure 1.[1]

Figure 1
Spring 1991 Dowling Elementary
Reading Comprehension Distribution



For the CAT math concepts/applications test, the score delineating the bottom fifth, the median score, and the score needed to place in the top fifth of the Dowling distribution corresponded to the 21st, 56th, and 89th national percentiles, respectively. Figure 2 shows the entire Dowling math distribution for all students tested in 1991.

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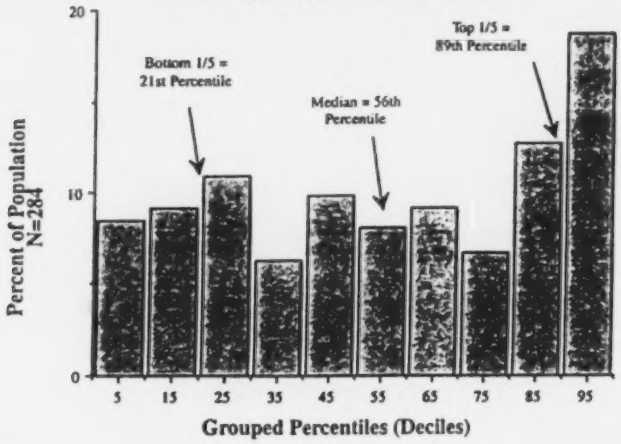
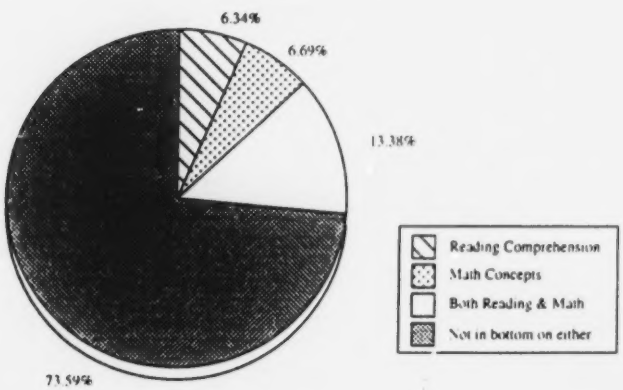
Figure 2
Spring 1991 Dowling Elementary
Math Concepts/Applications Distribution



Once the cutoffs for the bottom and top fifths of the reading and math distributions were established, it was possible to examine the grade distribution and identify the students who scored in the upper and lower 20%. Since math and reading measures were used independently to determine the bottom- and top- 20% groups (also referred to herein as the "low-20" and "high-20" groups), it was also possible to determine the number identified by either or both procedures. Figure 3 depicts the low-20 group as identified by the reading measure alone, math measure alone, or both.

Through examining Figure 3, one notes that using two measures independently to determine the identity of students in the bottom 20% actually produces a combined total of 26.4% of the Dowling population as identified by either measure.

Figure 3
Dowling Bottom 20% of Achievement by Area
N=284



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Characteristics of Students at the Margins

With the lower and upper fifths of the distribution established, our next step was to consider the demographic characteristics of the students in each group. Merging the 20/20 achievement data with district codes for "free or reduced-price lunch" resulted in a breakdown of achievement related to socioeconomic status (SES). Table 1 summarizes the data for all Dowling students who took the CAT and had valid lunch codes in the district database (n=284). There is a high correlation between SES (as determined by participation in free or reduced-price lunch programs) and reading achievement: two thirds (67%) of the students in the low-20 group were receiving free or reduced-price lunch.

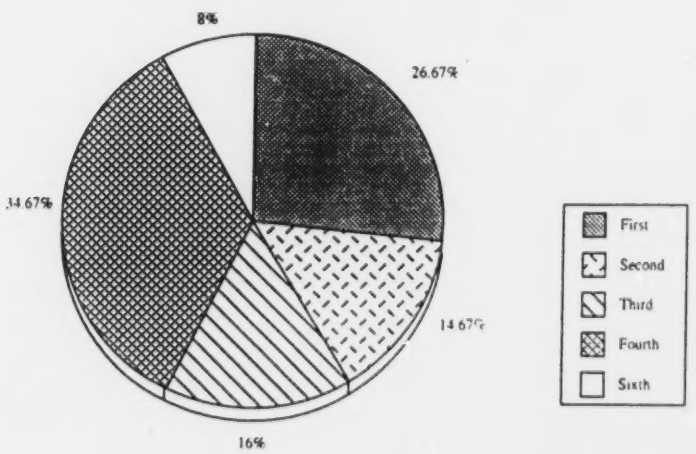
Table 1

Percentages of students in 20/20 groups based on CAT reading comprehension who receive free and reduced-price lunch compared to the total school.

	Bottom 20%	Top 20%	Total school
Percent free lunch	58%	10%	31%
Percent reduced-price lunch	9%	0%	7
Total percent free or reduced-price lunch	**67%**	**10%**	**38%**

In Figure 4, the Dowling students who scored in the bottom 20% of either the math or reading distributions are broken down by grade. One notes the overrepresentation of first- and fourth-grade students in this group.

Figure 4
Bottom 20% of Achievement in Reading or Math by Grade
N=75



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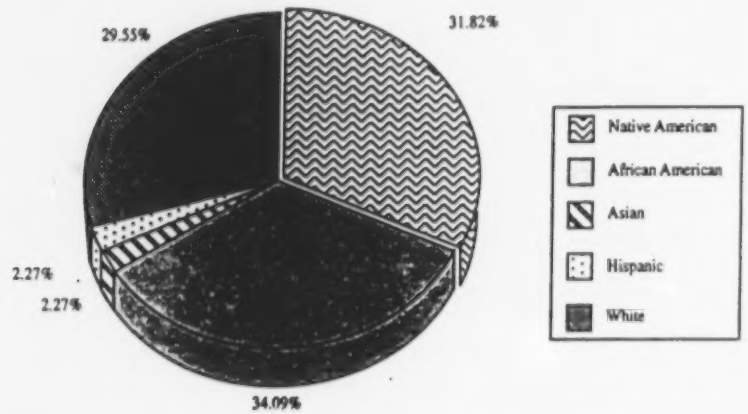
In Figure 5a, the students in the bottom 20% of the reading distribution are broken down by racial/ethnic group and then compared to the racial/ethnic breakdown of all students who took the CAT reading test in 1991 (see Figure 5b). Consideration of Figures 5a and 5b reveals that while Native-American students comprise only 13% of the total student population, they account for more than twice that percentage in the low-20 group (32%). Similarly, African-American students comprise 16% of the total population at Dowling School but 34% of the low-20 group.

Figure 5a
Bottom 20% of CAT Reading Distribution by Racial/Ethnic Group
N=45



The disproportionate representation of African Americans and Native Americans in the bottom 20% of the Dowling reading comprehension distribution is similar to district-wide achievement results for students of color. Data from the 1990-91 school year indicate that while 32% of students enrolled in the district were African American, this group comprised 49% of those in the bottom quartile in reading. Similarly, 51% of all Chapter 1 students in 1990-91, and 44% of special education students in the district, were African American.[2]

Figure 5b
1991 Dowling Ethnic Distribution
(for all 198 students who took the CAT)

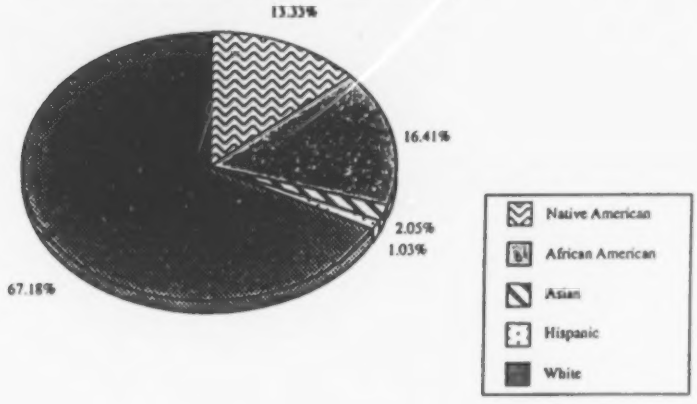
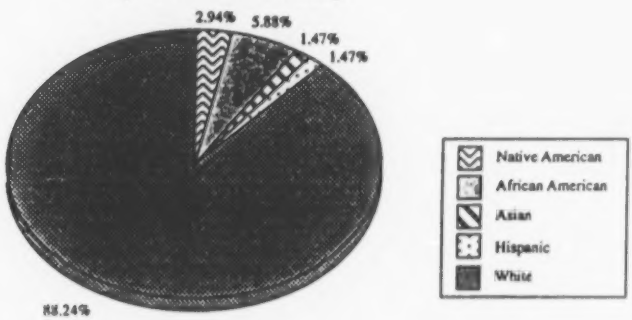


Figure 6 shows the students in the top 20% of the reading distribution broken down by racial/ethnic group. Comparing this figure with Figure 5b evidences the underrepresentation of African-American and Native-American students in the upper fifth of the reading achievement distribution.

Figure 6
Top 20% of CAT Reading Distribution
by Radical/Ethnic Group



Achievement Trends

The next step was to examine trends in achievement across time for students continuously enrolled at Dowling. Data for students who were in third and fourth grades in 1992 were available from the CATs given in Spring 1990, 1991, and 1992 and were downloaded from the district's mainframe computer. These data were analyzed to determine shifts in the distribution during this 3-year period at the bottom-20% cutoff point, the median score, and the top-20% cutoff point. A summary of the change in reading achievement for first and second graders tested on the CAT reading comprehension test in 1990 is presented in Figure 7.[3]

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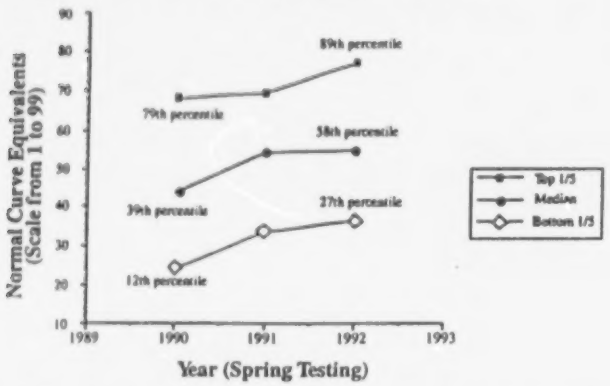
Figure 7
Dowling CAT Reading Comprehension 1990-92
Continuous Membership N=112
(plot of NCEs with national percentile change noted)



One can see from Figure 7 that large shifts in the reading achievement distribution were accomplished at each of the three points in the distribution. For example, in 1990 one fifth of students considered here were at or below the 12th national percentile in reading. By 1992, students who were enrolled continuously at Dowling showed an above average 27th national percentile at the cutoff for the bottom fifth of the school's distribution. Improvements were similar at the median, showing a rise from the 39th to the 58th national percentiles, and from the 79th to the 89th national percentiles for students at the cutoff for the top fifth of the school's distribution. This last figure shows that a full 20% of Dowling's continuously enrolled students were at or above the 89th percentile in 1992.

A similar plot of the shift in achievement on the CAT math concepts/applications domain for students tested in 1990, 1991, and 1992 is presented in Figure 8 below.

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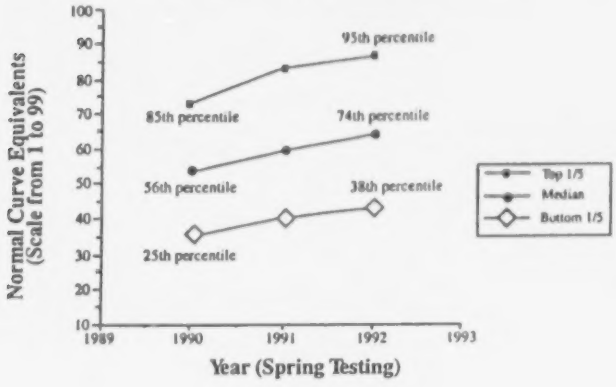
Figure 8

Dowling CAT Math Concepts 1990-92
Continuous Membership N=112
(plot of NCEs with national percentile change noted)



Again, the average (median) students or students near the bottom of the math distribution were not the only ones who made gains within the collaborative model at Dowling. The students near the top of the achievement distribution made gains similar to students near the median.[4] Gains of over 10 Normal Curve Equivalents (NCEs) for the median and top 20% of the distribution are quite significant; in fact, Slavin and Madden (1989) have indicated that NCE changes of 1/3 of a standard deviation (or about 7 NCEs) could be used as a benchmark for program effectiveness.

These achievement results were presented to the principal and leadership team at Dowling in the fall of the 1992-93 school year. The team was very encouraged by the achievement trends and suggested certain follow-up analyses be conducted to investigate whether similar achievement gains had been made by each of the racial/ethnic groups represented at Dowling. In order to conduct this analysis, data from all students tested at Dowling in 1990 were compared against the scores for the same students in 1992. This 2-year analysis included students tested in fourth grade in 1990 and in sixth grade in 1992 who were not included in the 3-year analysis.[5]

Figure 9 depicts the 2-year reading comprehension trend for African-American, Native-American, and white students who were enrolled at Dowling and tested using the CAT in 1990 and 1992. The median of the distribution for each ethnic group is plotted for both periods. For example, the 10th-ranked Native-American student (i.e., out of 19 continuously enrolled Native Americans at Dowling) scored at the 12th percentile on the CAT in reading in 1990, whereas the 10th-ranked Native-American student in 1992 scored at the 31st percentile.

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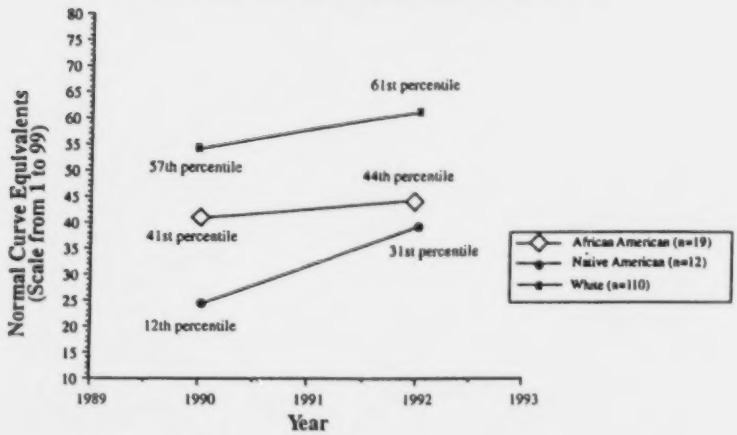
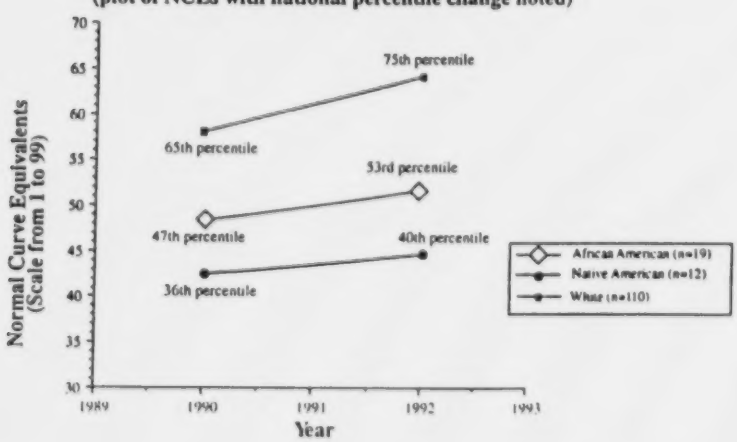
Figure 9
Dowling Gains in CAT Comprehension by Racial/Ethnic Category
Continuous Membership N=141
(plot of NCEs with national percentile change noted)



As one can see from Figures 9 and 10, all three racial/ethnic groups demonstrated a positive trend in median scores for reading and math from 1990 to 1992. The gain in the median score for African-American students was relatively less than the gain for Native Americans in reading but was quite similar in math. This type of trend analysis is central to the 20/20 process, which is most concerned with rates of progress for individuals and groups.

Figure 10
Dowling Gains in CAT Math Concepts by Racial/Ethnic Category
Continuous Membership N=141
(plot of NCEs with national percentile change noted)



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It is noteworthy that students were not separated physically by racial/ethnic groups in this analysis, but that it was possible to disaggregate data to show what progress was being made by various subgroups under the conditions then prevailing at the school.

Services for Students in the Bottom 20%

The next step focused on the services being provided to individual students in the school. Eight different instructional interventions/categories were identified and coded for Dowling students: social work groups, Higher Order Thinking (HOTS), mentoring, Native-American support, and gifted/talented, special education, Chapter 1, and collaborative services. Many students were identified as receiving multiple services while some students were not receiving any.

The complete listing of services and 20/20 groups for math and reading were presented to the building leadership. Table 2 reports only the primary categories of special education, Chapter 1, and collaborative services. For simplification of the table, if a student was receiving more than one of these services, the service listed to the left on the table was coded. For example, a student receiving both Chapter 1 and special education services was coded "Special," and a student in a collaborative services group who was also labeled Chapter 1 was coded "Chapter 1." Students listed under "Collaborative" were receiving that single service.

Table 2

Number of students receiving categorical services by the 20th-percentile cutoffs.

	Special	Chapter 1	Collaborative	Noncategorical	Total
Below 20% on reading only	6	9	5	19	39
Below 20% on math only	2	9	3	8	22
Below 20% on both	16	19	3	2	40
Above 20% on both	0	19	15	176	210
TOTAL	**24**	**56**	**26**	**205**	**311**

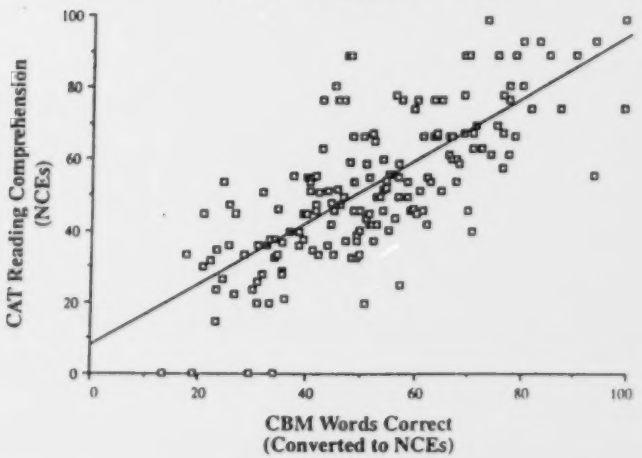
One can see from Table 2 that all (100%) of the Dowling special education students tested in 1991 were below the 20th-percentile in reading, math, or both areas. Thus, if a 20th-percentile cutoff (math and reading) had been used to offer special education services to students, not a single student who was actually classified to receive these services at the Dowling School in 1991 would have been omitted. Approximately two thirds (37/56=66%) of the Chapter 1 students and a little more than half (8/15=53%) of the collaborative service students scored below the 20th-percentile cutoff.

Cross-Validation with Curriculum-Based Measures

In Fall 1992, 20/20 at Dowling was repeated using curriculum-based measures (CBM) of reading (Deno, 1985). Oral reading from basal and literature passages provided a direct measure of reading for contrast and correlation with the CAT reading comprehension subtest scores. CBM scores were referenced to local norms and then converted to building percentiles in the same manner as the CAT scores from Spring 1992. Scores from grades 2-5 in CAT reading comprehension were then merged with CBM scores to determine the standard score correlation and degree of agreement in determining the 20/20 groups.

The standard score correlation (i.e., using NCEs) between the CAT reading comprehension and CBM Words Correct measures was .75 – a very high validity coefficient given the fact that the two tests were administered 5 months apart. The scatterplot shown in Figure 11 shows that most points in the bivariate distribution lie close to the regression line. There are some outlying students who scored low on one test and in the average range on the other, but the agreement on classifying students in the low- and high-20 groups is substantial.

Figure 11
Correlation between CAT Reading Comprehension and CBM Words Correct (Dowling Grades 2-5)
y = 7.8532 + 0.86585x R=.75



Agreement in classifying the 20/20 groups is presented in Table 3. The agreement for the top fifth of the distribution was 76% (26/34) and for the bottom fifth, 65% (22/34); overall the classification agreement was 76% (133/175).

Table 3

Agreement in 20/20 classification between the CBM and CAT reading comprehension measures.

	Bottom 1/5 CBM	Middle group CBM	Top 1/5 CBM	Total	Percent agreement
Bottom 1/5 CAT	22	12	0	34	65%
CAT middle group	9	85	13	107	79%
Top 1/5 CAT	0	8	26	34	73%
TOTAL	**31**	**105**	**39**	**175**	**76%**

With the information provided in the comparison of CBM and CAT reading comprehension scores, the staff at Dowling are currently assessing the costs and benefits of using one procedure over the other. In general, any form of authentic or performance-based assessment which can be put on a rank order scale can potentially be used in 20/20. As Reynolds and Zetlin (1993) indicate in *A Manual for 20/20 Analysis*,

> In [20/20] one simply starts with whatever assessment procedures are in use in the schools being studied. It is assumed that there will always be efforts to improve procedures for testing and decision making in the schools. This plan proposes that educators doing 20/20 analyses should join in efforts to improve assessment procedures, and be ready to use new approaches as their validity is established. . . . In summary, one starts with the assessments in hand . . . but then helps to find better approaches as rapidly as possible. (pp. 10-11)

II. District-Wide 20/20

Demographic and Service Summary Data

District-wide 20/20 Analysis for all elementary schools (n=50) was performed using Spring 1992 CAT reading comprehension tests. The cutoff points for the top and bottom fifths of the reading distributions were obtained for students in all 50 schools, including all special-needs students. For students who were not tested in Spring 1992, the test score for the preceding school year was used. For example, since fifth graders were not tested in 1992 with the CAT, their fourth-grade scores from Spring 1991 were used.

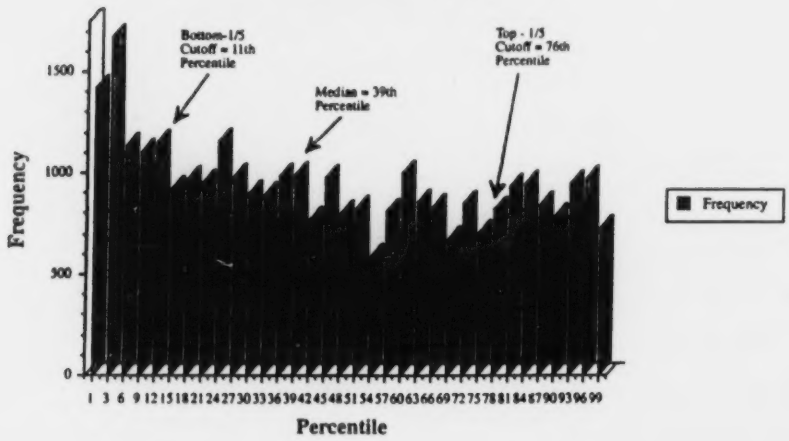
Each student enrolled in MPS elementary schools in Spring 1992 was assigned a score for reading comprehension. Moderately and severely handicapped special education students who were not tested were assigned the 1st percentile while mildly handicapped students were assigned the percentile of their most recent testing. For some students who were not tested prior to 1992, the reading comprehension score for Spring 1993 was used as the best estimate of performance for 20/20.

Once achievement cutoffs were established, the analysis was conducted according to the same procedures as those used for Dowling Elementary. Percentages of handicapped students captured by the bottom one-fifth cutoff were tallied by disability designation for each school. Similarly, the percentages of Chapter 1, Limited English Proficiency (LEP), and gifted/talented students falling within the bottom and top fifths of

the distribution were calculated. 20/20 groups were contrasted on racial/ethnic status, free or reduced-price lunch status, "resides with" codes, and gender. The tables and figures contained in this section summarize the overall findings.

The average cutoff score for the bottom fifth of the achievement distribution for all elementary schools combined was the 11th percentile nationally on the CAT reading comprehension measure. The distribution of scores for all students with test scores is presented in Figure 12. If data for MPS elementary schools were exactly comparable to data for students nationally, the bars comprising the graph (Figure 12) would be flat or even. In fact, they show elevation to the low (left) side of the figure, indicating an excess of low scores in reading for MPS students as compared with national norms which, despite the fact that the data show a distribution almost at national average levels near the top of the scale, is most notable.

Figure 12
MPS Elementary Reading Comprehension Distribution
Total Students Tested = 25,112


Bottom-1/5 Cutoff = 11th Percentile
Median = 39th Percentile
Top - 1/5 Cutoff = 76th Percentile
Frequency
1500
1000
500
0
1 3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72 75 78 81 84 87 90 93 96 99
Percentile
Frequency

20/20 could be performed on the distribution of scores for the whole district (see Table 6), but since it is designed for local school initiative, it is more appropriate to identify cutoff points individually for each school, perform separate analyses based on the actual cutoffs for each school, and then aggregate the total district data based on these analyses.

Individual school analysis was conducted on all elementary schools using the 1992 CAT reading comprehension scores along with information related to LEP and special education caseloads. Every student enrolled in grades 1-6 was entered into the analysis for each school. The achievement distributions varied greatly from school to school as can be seen from the distribution of bottom-fifth cutoffs shown in Figure 13.

In Figure 13, one can see the very large differences in overall achievement levels among MPS elementary schools. The bottom-fifth cutoff ranged from the 1st percentile on national CAT norms in two

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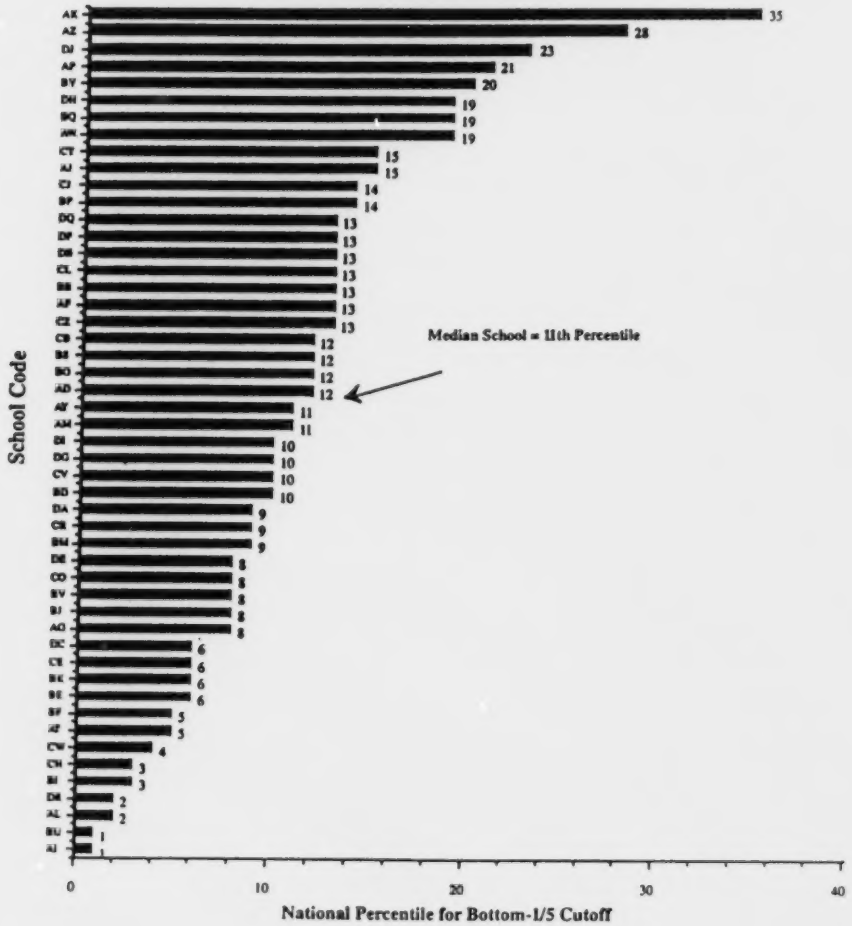
schools to the 35th percentile in one school. Similarly, although not graphed here, the distribution of cutoffs for the top fifth of the reading comprehension distribution ranged from the 39th to the 91st percentile.

Figure 13
CAT Reading Comprehension Bottom-20th Percentile Cutoff by School



Demographic breakdowns of the bottom and top fifths of the distributions were calculated for each school using the same method employed for Dowling Elementary. A summary of these demographic contrasts is presented in Table 4a below.

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Table 4a

Percentages of students in 20/20 groups (reading) who are receiving free or reduced-price lunch, living with single parents, or students of color compared to district total elementary percentages.

	Bottom 20%	Top 20%	Total elementary
Percent free or reduced-price lunch	76%	33%	56%
Percent living with single parents	61%	31%	49%
Percent students of color	75%	30%	55%

For the total population of MPS elementary school students, 56% received free or reduced-price lunch. If there were no correlations with low-20 and high-20 groups, the figure would be about 56% in each group. However, as shown in Table 4a, 76% of students in the low-20 group received free or reduced-price lunch whereas this figure was only 31% for students in the high-20 group. Data from Table 4a also show disproportionalities with reference to "percent living with single parents" and "percent students of color."

20/20 can also be used to investigate relationships among demographic variables. For example, Table 4b reports data for all grade 1-3 students in the low-20 group by free or reduced-price lunch and racial/ethnic codes. These data show the strong relationship between indicators of poverty and racial/ethnic status for marginally achieving students. Students of color in the bottom 20% of the district reading achievement distribution ranged from 80% to 92% free or reduced-price lunch status. White students also exhibited higher proportions of free or reduced-price lunch status in the low-20 group (56%).

Table 4b

Relationship between free or reduced-price lunch and racial/ethnic status for students in the bottom-20% group (reading).

	Free or reduced-price lunch	Full-price lunch	Percent free or reduced-price lunch
African American	1380	221	86%
Asian	396	34	92%
Native American	317	76	81%
Hispanic	91	23	80%
White	479	376	56%
TOTAL	**2663**	**730**	**79%**

20/20 cutoffs were also tabulated for various categorical programs and student disability labels. Table 5 summarizes the 20/20 groups for students served in special education, Chapter 1, LEP, and gifted/talented programs as identified in the district mainframe computer codes in December 1992.

Table 5 indicates the percentages of students in each 20/20 group receiving services from various categorical programs. For example, 26% of the students in low-20 groups on reading achievement, according to individual school cutoffs, received special education services under the primary handicapping condition of learning disabled. Overall, 36% of the students in the bottom fifths of their respective school distributions were receiving special education services in 1992. Similarly, 26% of students in low-20 groups received Chapter 1 services, and 23% received LEP services. The unduplicated total of students receiving categorical services was 66%; that is, about two thirds of the students in the bottom fifths of their schools in reading were receiving some form of categorical service.[6] The aggregate of all data on the top fifths of each school's reading distribution revealed that 30% of these high-20 students were being served in gifted/talented programs.

Table 5

Percentages of students in 20/20 groups (reading) in categorical programs.

	Bottom 20%	Top 20%	Total elementary
Special education: Learning disabled	26%	.3%	7%
Special education: Mentally handicapped	4%	0%	1%
Special education: E/BD	2%	.2%	1%
Special education: Speech and language	3%	1%	2%
Special education: Physically handicapped	.4%	0%	.2%
Special education: Other handicaps	.6%	0%	.2%
Special education: All disabilities	**36%**	**.3%**	**12%**
Chapter 1	26%	2%	15%
LEP	23%	1%	10%
Total categorical: remedial/special education (unduplicated)	**66%**	**4%**	**30%**
Gifted/talented	2%	30%	12%

The data contained in Table 6 are presented on a district-wide basis. Compared with Table 5, in which all students are grouped according to their presence in low- or high-20 groups in their individual schools, Table 6 shows that an even larger percentage of low-20 students in reading receive some form of categorical service. This table indicates that approximately 85% (as opposed to 66% on Table 5) of the students who scored below the district-wide 20th-percentile cutoff in reading (the 11th percentile nationally) were receiving special education, Chapter 1, or LEP services.

Although Table 6 demonstrates that 20/20 can readily be utilized on a district-wide basis and focused on specific demographic characteristics (in this case, students in grades 1-3), a key component of 20/20 is to get local school staff interested in examining students who are making less than adequate academic progress but who are not receiving individual attention from specialists in the building. As building staff look closely at those students at the margins they not only identify factors which the school cannot modify and which are correlated with achievement (such as poverty and single-parent families), but they also more productively attend to variables which can be manipulated by teachers and which have been shown to impact achievement. This sort of school-wide focus may lead to a reorganization of categorical services in a more coordinated and efficient manner to reach all students at the margins. Certain critical variables which affect academic performance for all students—such as flexible pacing and increased time on task—may become the focus of collaborative efforts among regular teachers, specialists, parents, and administrators. It is the ultimate goal of 20/20 to first identify individual students who need such adaptations and then empower all individuals responsible for student achievement to focus on instructional arrangements that have the greatest chance of maximizing student performance.

Table 6

Number and percentage of students in grades 1-3 who scored below the district-wide 20th-percentile (reading) cutoff (i.e., the 11th national percentile) served in special education, Chapter 1, and Limited English Proficiency (LEP) programs.

Category	Bottom 20%
Special education: Learning disabled	703
Special education: Mentally handicapped	16
Special education: E/BD	56
Special education: Speech and language	127
Special education: Physically handicapped	12
Special education: Other handicaps	9
Special education: All disabilities	**923**
Chapter 1	1408
LEP	328
Total categorical services	**2659**
Total students in bottom-20% group	3134
Percent of bottom-20% group served	**84.8%**

III. Continuous Progress Graphs Illustrating Student Progress in Reading

The continuous membership database of all students enrolled for 3 years and tested using CAT provides an opportunity for considering not only the average performance for a school (e.g., the median score, which represents the middle score in a school's distribution) but also for examining the margins to see that students at or below the bottom-fifth cutoff and at or above the top-fifth cutoff are making adequate achievement gains. The reading graphs presented in the appendices depict progress first for all grades K-6 and K-8 MPS schools (Appendix A, Figures 15-41); then for grades K-3 schools (Appendix B, Figures 42-53); and finally for grades 4-6 schools (Appendix C, Figures 54-60). The K-6 and K-8 MPS school graphs include progress data for three grades across 3 years (i.e., the first-, second-, and fourth-grade students in 1990 who are enrolled in the same school 2 years later in third, fourth, and sixth grades).

How to Read these Graphs

Each graph is based on scores from all students who were enrolled and tested all 3 years in the same school.[7]

Figure 14 shows the progress trends for all students in K-6 or K-8 schools from 1990-92 (n=4,589) and is used as an example here for pointing out the key features for understanding the figures presented in the appendices.

These graphs depict progress using NCE scores. Scaled from 1 to 99, NCE scores are similar to percentile scores, yet have the advantage of being calibrated on an equal-interval scale, which allows data from several grades to be legitimately aggregated and reported. Furthermore, this scale allows comparison of progress at the top- and bottom-fifth cutoffs of the distribution.

On the NCE scale, the 1st percentile equals 1 NCE, the 50th percentile equals 50 NCEs, and the 99th percentile equals 99 NCEs. However, these are the only points of correspondence. One can see from Figure 14 that the 80th percentile equals 68 NCEs, while the 20th-percentile equals 32 NCEs. The 20th, 50th, and 80th national percentiles are indicated by solid lines. For schools whose distributions are vastly lower than national distributions, these lines are omitted.

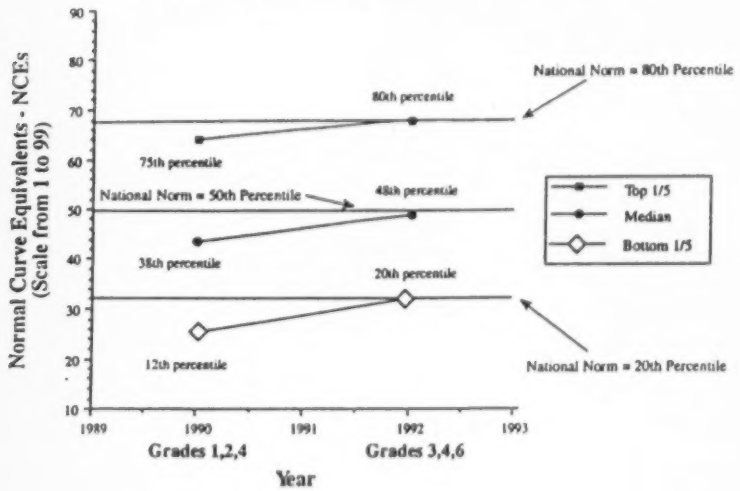
Figure 14 shows that students in K-6 and K-8 schools have made progress in their standing on national norms at the 20th-percentile cutoff point, the median, and the 80th-percentile cutoff point. When gains are seen at all points in the distribution, it can be stated clearly that the MPS elementary school population as a whole is making progress. Some of the graphs in this section show no gains at all, while others show gains for the bottoms and tops of the distributions only.

The presentation of data in this section is descriptive, not inferential. That is, these data are not appropriate for hypothesis testing such as, "Are the gains from school A significantly different from school B for the bottom group?" Other types of experimental procedures would be needed to perform such analyses. These graphs are presented for the general purpose of stimulating interest in the measurement of student progress trends and specifically for examining achievement trends for students at the margins.

As in Figure 14, which represents the entire district, most of the individual school graphs show

substantial gains at both margins in reference to national norms for reading comprehension. Again, these gains reflect the progress of students continuously enrolled. In Figure 14, these gains represent the 4,589 students who were enrolled and tested in the district for all 3 years; the gains on the individual school graphs represent students enrolled and tested in given schools for all 3 years.

Figure 14
MPS K-6 & K-8 Elementary Schools CAT Reading Comprehension 1990-92
Continuous Membership N=4,589
(plot of NCEs with national percentile change noted)



The data for individual schools are presented below without supplementary narrative explanations. However, brief comment may be useful in connection with the first graph, which represents Andersen Open School (Figure 15). It may be observed that data for 1990 showed that pupils at Andersen scored somewhat below average in reading compared to the nation's children in general (the 20th, 50th, and 80th school percentiles at Andersen corresponded with the 9th, 26th, and 62nd national percentiles). In the 2-year period from 1990-92, the data show an advance in reading achievement, relative to national norms, on all three levels. Although these data are only for students who were continuously enrolled at Andersen, it may be fair to conclude, at least tentatively, that positive changes were occurring for students at the school over this period.

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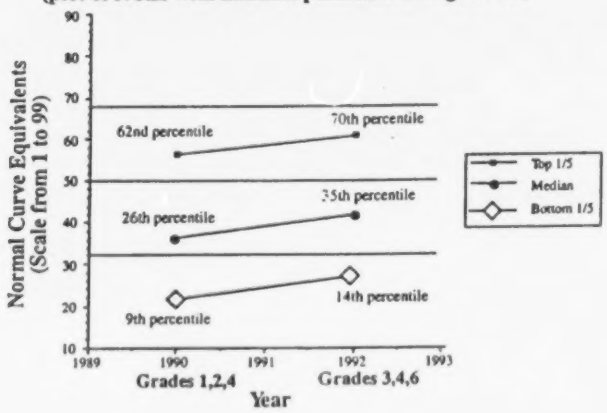
Figure 15

Andersen Open CAT Reading Comprehension 1990-92
Continuous Membership N=176
(plot of NCEs with national percentile change noted)



IV. Implications and Possible Uses of the Procedure

It is possible to generate several types of data with 20/20 Analysis. The procedures are simple and low cost. The data are easily and quickly understandable by all stakeholders in the school situation, most significantly by parents. Some potential uses of the procedure are explained briefly below.

Allocation of Students to Special Support Services

A key recommendation of the developers of 20/20 is that schools might use the procedure in selecting students to receive especially intensive instruction on basic elements of the curriculum. As shown in data for MPS schools grades K-3, 85% of students in low-20 groups are already in categorical programs. We suggest establishing—as policy—that whenever a student falls into the lower fifth of his or her class in rate of progress in basic skills, his or her parents be notified and a conference be held to advance ideas and plans that promise better results. No labels are involved, only the basic acknowledgment of a need to do better. A simplified Individualized Educational Plan (IEP) format has been designed which could be used in all low-20 cases. It meets federal requirements but is simplified in several respects. This format includes a brief section for recording commitments parents are willing to make to enhance the student's life circumstances, in addition to detailed plans for instruction and management in school. As soon as feasible, we would propose that the commitment to collaboration with parents and individualized planning be extended to top-20 students as well. Under this allocation plan, parents and teachers also would be permitted to refer non-20/20 students for special diagnostic studies and programmatic adaptations. For example, students with hearing or vision problems might not fall into 20/20 groups but still require adapted instructional programs. Similarly, students showing extreme emotional problems would well require special accommodations even if their achievement records were adequate.

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Redeployment of School Psychologists

The allocation plan suggested above would result in opportunities to redeploy psychologists from simple psychometric and classification functions and permit them to become engaged in functions more closely related to instructional improvements. For example, psychologists might be expected to provide leadership to programs relating to uses of time (in school and/or at home), as well as advancing practices related to student resilience, metacognition, and social behavior.

New Approaches to Accountability and Program Evaluation

The 20/20 procedure produces data revealing directly and immediately how well schools are doing in causing learning. Although the procedure would require careful interpretations, the data have a great deal of face validity in showing whether individual schools are exhibiting progress in students' learning outcomes.

New Approaches to Allocation of Resources

Data included in this report show enormous differences among schools in the number of students who are behind in their learning. There are schools in the present study in which 20% or more of the pupils rank at or below the 5th percentile on national norms. Clearly, changes are needed in such school situations to provide more intensive help to students whose progress is minimal. The 20/20 procedure may be especially useful in such cases because it looks to the margins, not only to means or medians. Recent discussions about how efforts to revise Chapter 1 programs have the apparent effect of concentrating special resources in schools that serve relatively large populations of poor children and those showing least progress in learning are relevant to what is proposed here—using data focused on the margins as a basis for allocating compensatory and remedial resources.

Disaggregation of Data on School Learning

Having data available in centralized computer files makes it very simple to disaggregate data for a variety of purposes. For example:

- Data for successive grade levels can show that a given school might receive pupils of relatively low standing in early grades but who show consistent gains as they advance through successive grades. Examples of such analyses are shown in this report. When there is evidence of such improvements, there is reason to continue support to programs that appear to be producing desired results.
- Data can be disaggregated to show for a given school or district as a whole how students of various racial/ethnic, socioeconomic, or gender groups are progressing. Therefore, without segregating groups of students in any way, we can show how children of poor families, for example, are performing under various conditions in school. Data which reveal such results can thus be used in school planning and in collaborative work with parents to reach desired improvements.
- Data can be disaggregated to show the achievement records of pupils who are continuously enrolled compared with those who change schools frequently. Such data can be useful in setting policies that influence continuity in school placements.

Conclusion

20/20 is proposed as a simple, low-cost, and efficient procedure for analyzing students' progress and evaluating programs provided for them. It looks to the margins, as well as to central tendencies, in assembling data for school planning. Potentially, 20/20 can assist in diminishing classifications and—the sometimes demeaning—labeling of students, and help in creating inclusive and powerful schools that serve our increasingly diverse student population. It offers ways of observing how various subpopulations of students (by race, ethnicity, socioeconomic level, etc.) are performing in schools through aggregates of data, *not* by forming special homogeneous groups for instruction. The procedure can be helpful in redeployment of some specialists, such as school psychologists, in ways that foster instructional improvements based on well-confirmed knowledge about human learning. Experience, so far, is that 20/20 procedures are readily understood by parents and can provide the basis for increased school-home collaboration. 20/20 Analysis offers a dynamic alternative to the disjointedness of numerous narrowly formed categorical programs, which are evaluated mainly in procedural terms, and opens opportunities for creative approaches to instruction for *all* students.

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Endnotes

1 If the Dowling distribution were equivalent to national norms at all points in the distribution, there would be a rectangular shape to the graph with 10% of all students in the school scoring at each decile.

2 These data are summarized in detail in *Disproportionate Representation in Special Education*, an unpublished evaluation paper presented to the MPS Superintendent's Cabinet, March 25, 1991.

3 It should be noted that the change in the reading achievement distribution from 1990 to 1992 depicted in Figure 7 is plotted using Normal Curve Equivalents (NCEs), an equal interval metric. Plots of percentile units tend to inflate gains near the median and underrepresent gains near the margins of the distribution. Percentile points are noted on the graph for familiar reference but should not be subtracted to compare gains at different points in the distribution.

4 For technically sophisticated readers, the results of the analysis presented here are not affected by the problem of "regression to the mean." The 20% and 80% cutoffs reflect shifts in the entire distributions rather than parameters of groups selected on the basis of extreme scores.

5 Because no fifth graders were tested with the CAT, it was not possible to include these students in the 3-year analysis depicted in Figures 7 and 8.

6 Since some students receive multiple services (e.g., Chapter 1 and special education) the total of LEP, special education, and Chapter 1 percentages add up to more than the unduplicated total.

7 This deliberately includes special education and LEP program students who are sometimes excluded from MPS's district-wide testing summaries. 20/20, with its focus on students at the margins, always includes every student in the building for whom an appropriate outcome measure can be found.

Appendix A
Reading Graphs for Grades K-6 and K-8 Schools
1990-92

Figure 16
Bethune CAT Reading Comprehension 1990-92
Continuous Membership N= 48
(plot of NCEs with national percentile noted)

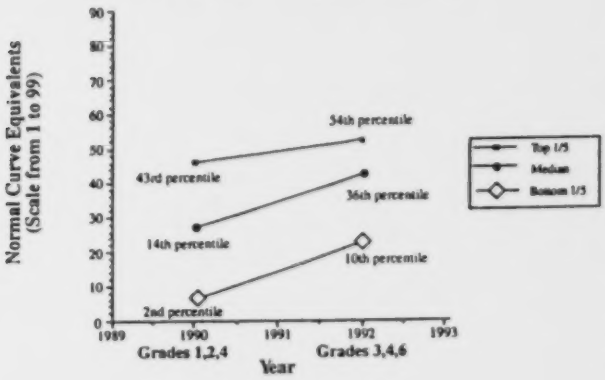

Figure 17
Bethune Public School Academy (PSA)
CAT Reading Comprehension 1990-92
Continuous Membership N=60
(plot of NCEs with national percentile change noted)

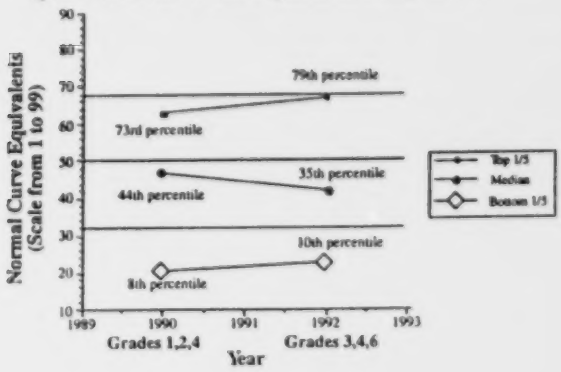

Figure 18
Burroughs CAT Reading Comprehension 1990-92
Continuous Membership N= 177
(plot of NCEs with national percentile change noted)

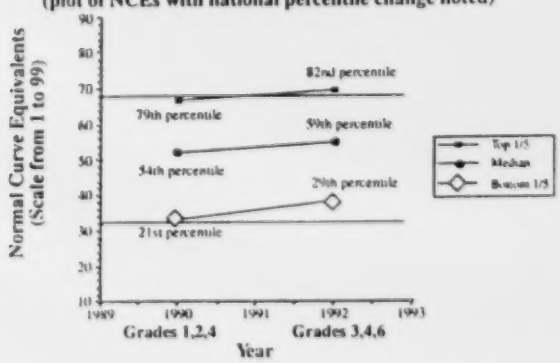

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Figure 19
Dowling CAT Reading Comprehension 1990-92
Continuous Membership N=144
(plot of NCEs with national percentile change noted)

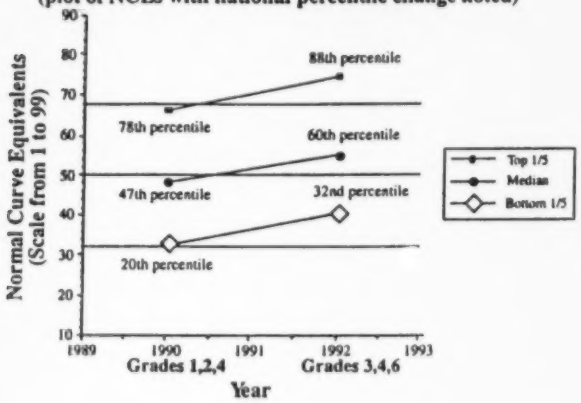

Figure 20
Fulton CAT Reading Comprehension 1990-92
Continuous Membership N=188
(plot of NCEs with national percentile change noted)

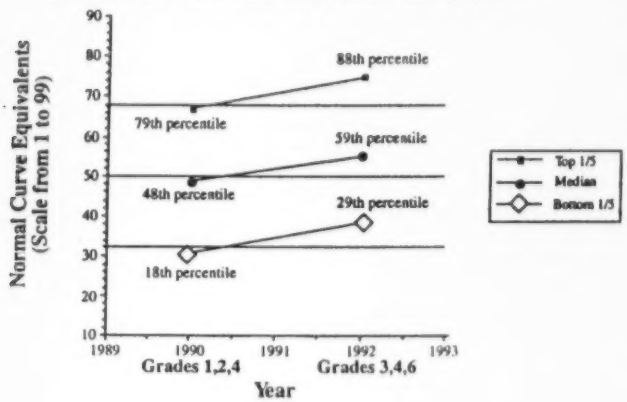

Figure 21
Hall CAT Reading Comprehension 1990-92
Continuous Membership N= 95
(plot of NCEs with national percentile change noted)

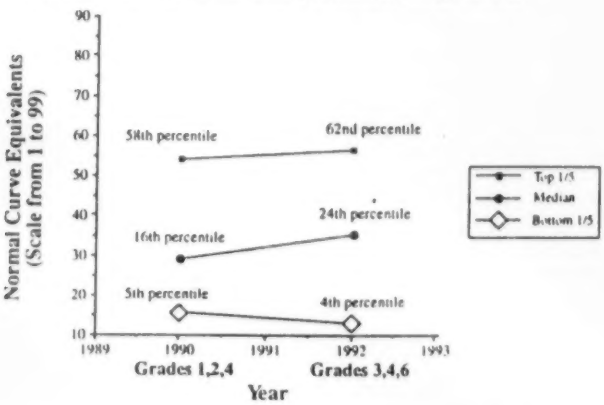

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Figure 22

Hamilton CAT Reading Comprehension 1990-92
Continuous Membership N=60
(plot of NCEs with national percentile change noted)

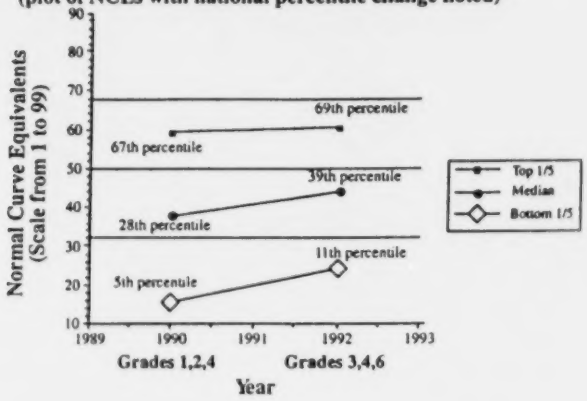

Figure 23

Jefferson CAT Reading Comprehension 1990-92
Continuous Membership N=128
(plot of NCEs with national percentile change noted)

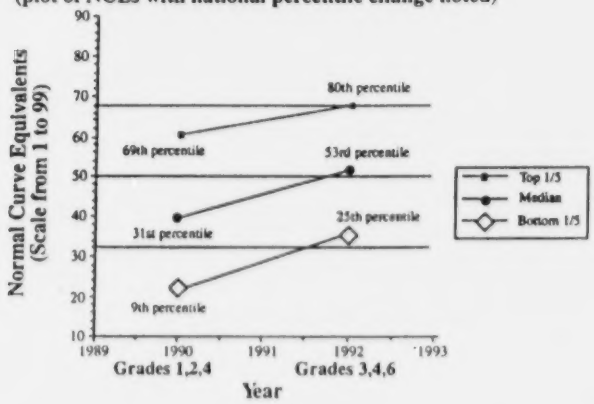

Figure 24

Kenwood CAT Reading Comprehension 1990-92
Continuous Membership N=169
(plot of NCEs with national percentile change noted)

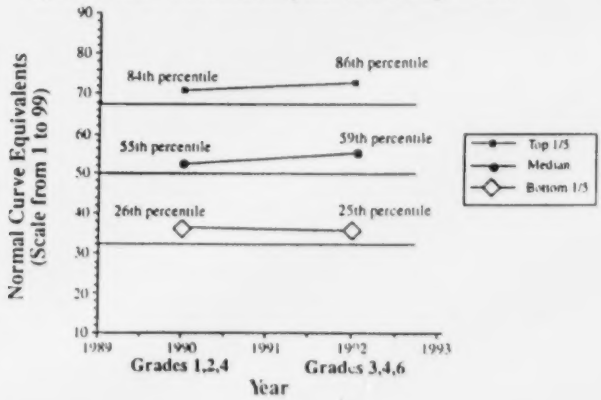

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Figure 25

Lincoln CAT Reading Comprehension 1990-92
Continuous Membership N=206
(plot of NCEs with national percentile change noted)

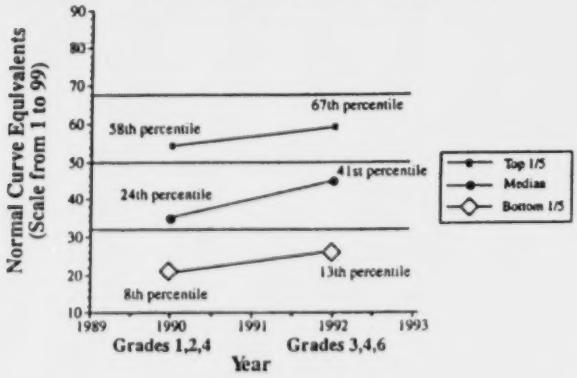

Figure 26

Marcy CAT Reading Comprehension 1990-92
Continuous Membership N= 104
(plot of NCEs with national percentile change noted)

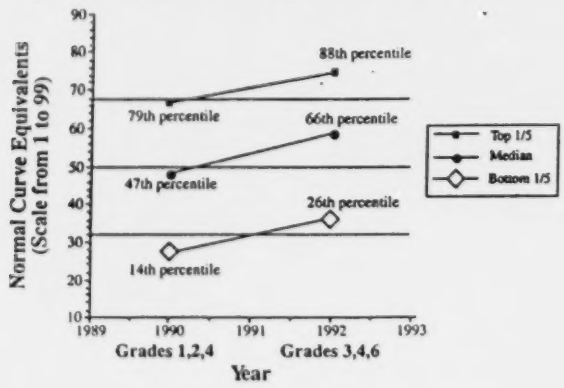

Figure 27

Olson CAT Reading Comprehension 1990-92
Continuous Membership N= 224
(plot of NCEs with national percentile change noted)

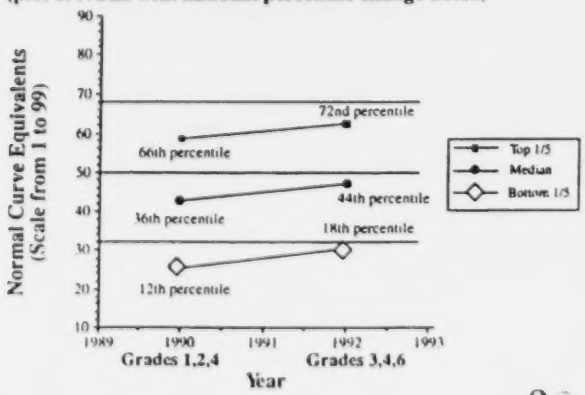

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Figure 28

Barton CAT Reading Comprehension 1990-92
Continuous Membership N=114
(plot of NCEs with national percentile change noted)

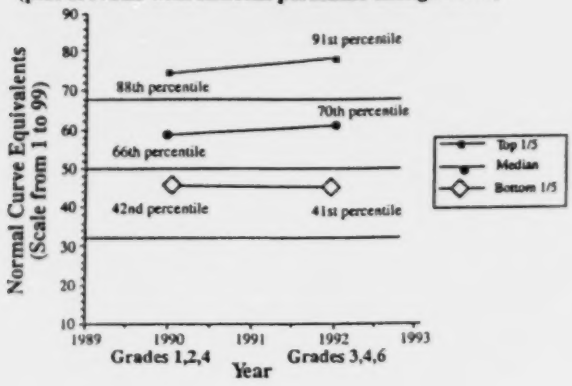

Figure 29

Putnam CAT Reading Comprehension 1990-92
Continuous Membership N=42
(plot of NCEs with national percentile change noted)

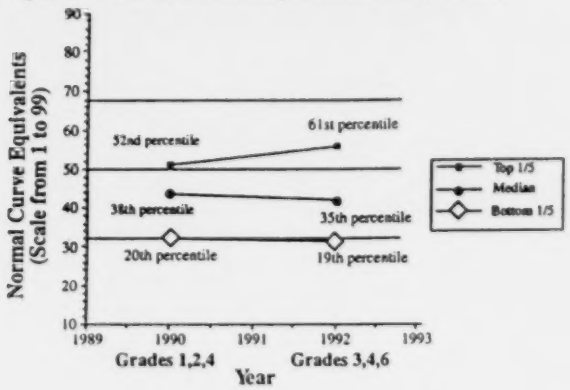

Figure 30

Seward Montessori CAT Reading Comprehension 1990-92
Continuous Membership N=118
(plot of NCEs with national percentile change noted)

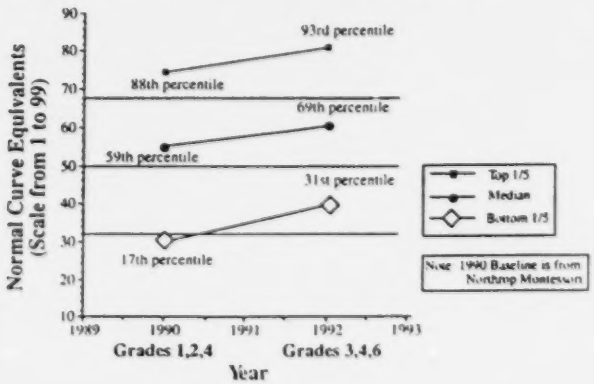

Figure 31

Sheridan CAT Reading Comprehension 1990-92
Continuous Membership N=101
(plot of NCEs with national percentile change noted)

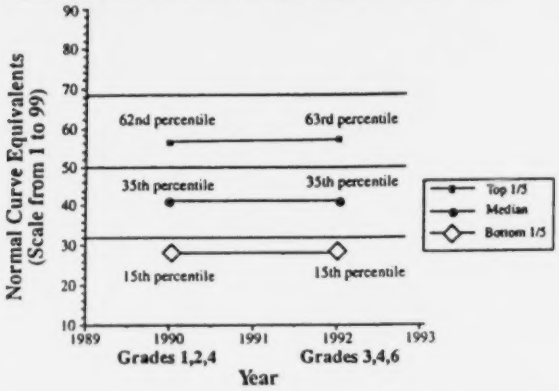

Figure 32

Ramsey Fine Arts Reading Comprehension 1990-92
Continuous Membership N=179
(plot of NCEs with national percentile change noted)

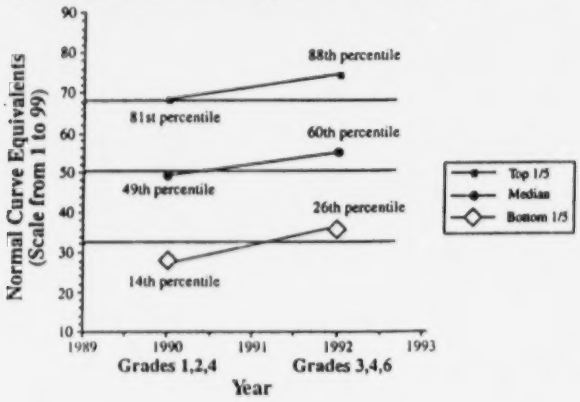

Figure 33

Tuttle Reading Comprehension 1990-92
Continuous Membership N=95
(plot of NCEs with national percentile change noted)

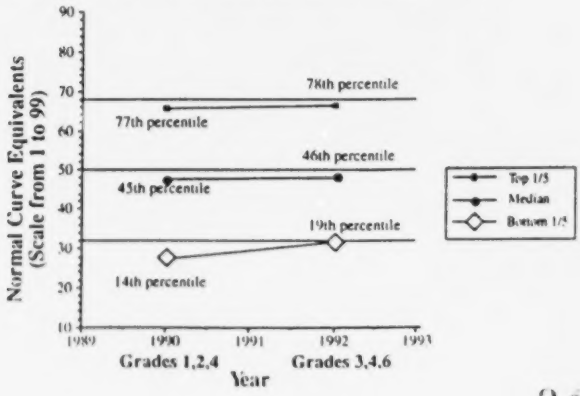

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Figure 34
Webster CAT Reading Comprehension 1990-92
Continuous Membership N=154
(plot of NCEs with national percentile change noted)

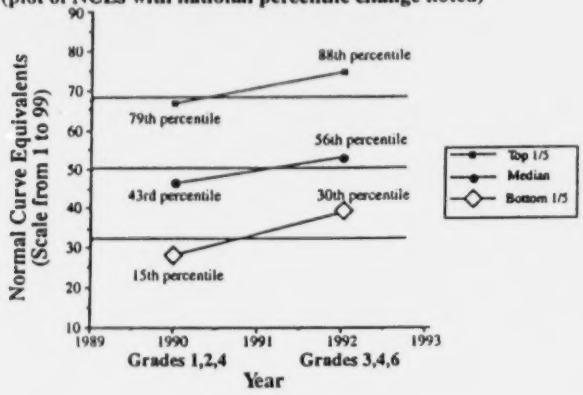

Figure 35
Willard M/S/T Reading Comprehension 1990-92
Continuous Membership N=170
(plot of NCEs with national percentile change noted)

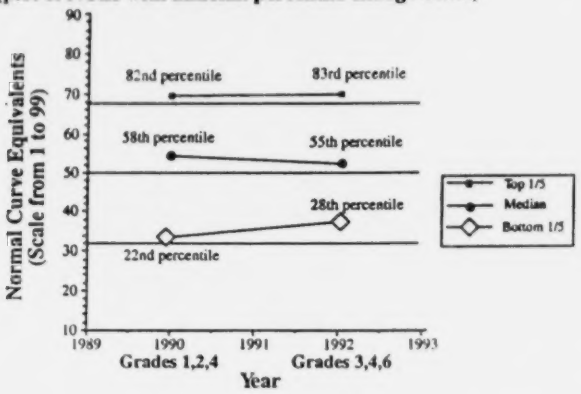

Figure 36
Windom CAT Reading Comprehension 1990-92
Continuous Membership N=110
(plot of NCEs with national percentile change noted)

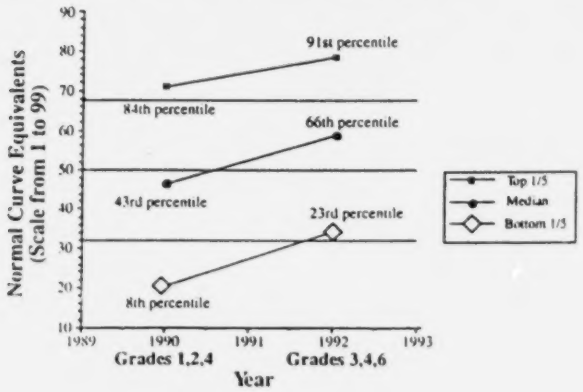

Figure 37
Wilder Fundamentals CAT Reading Comprehension 1990-92
Continuous Membership N=165
(plot of NCEs with national percentile change noted)

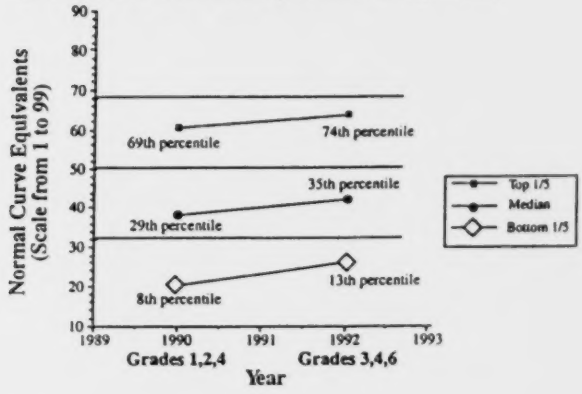

Figure 38
Wilder M/S/T CAT Reading Comprehension 1990-92
Continuous Membership N=65
(plot of NCEs with national percentile change noted)

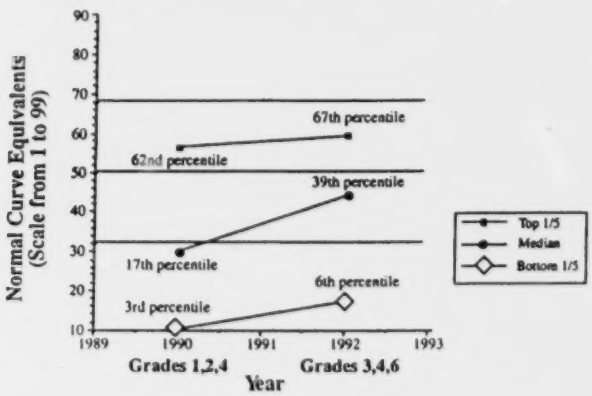

Figure 39
Marcy CAT Reading Comprehension 1990-92
Continuous Membership N= 104
(plot of NCEs with national percentile change noted)

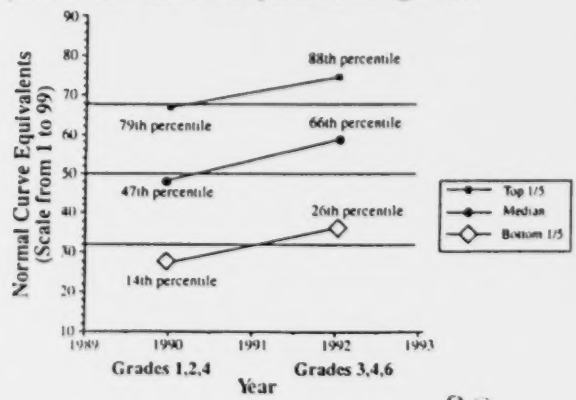

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Figure 40
Wilder M/S/T CAT Reading Comprehension 1990-92
Continuous Membership N=65
(plot of NCEs with national percentile change noted)

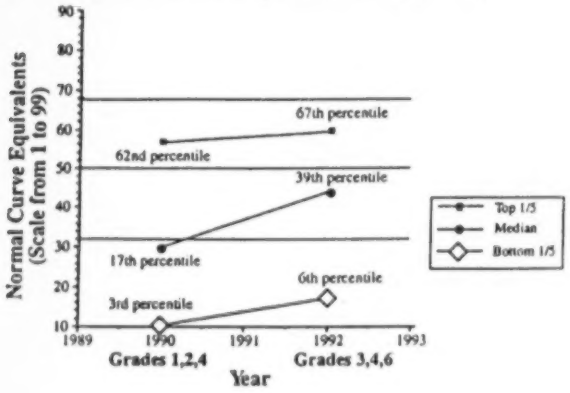
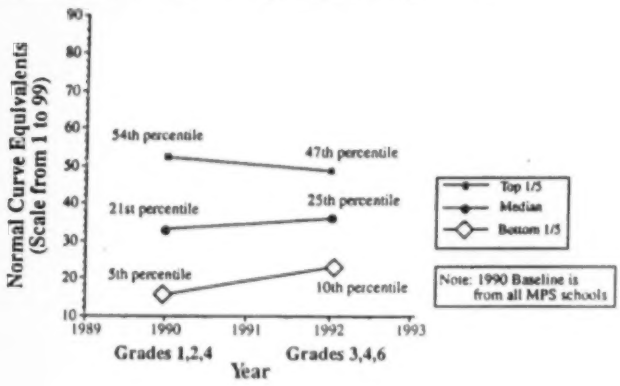


Figure 41
Four Winds CAT Reading Comprehension 1990-92
Continuous Membership N=99
(plot of NCEs with national percentile change noted)



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Appendix B
Reading Graphs for Grades K-3 Schools
1990-92

Figure 42
MPS K-3 Elementary Schools CAT Reading Comprehension 1990-92
Continuous Membership N=1,841
(plot of NCEs with national percentile change noted)

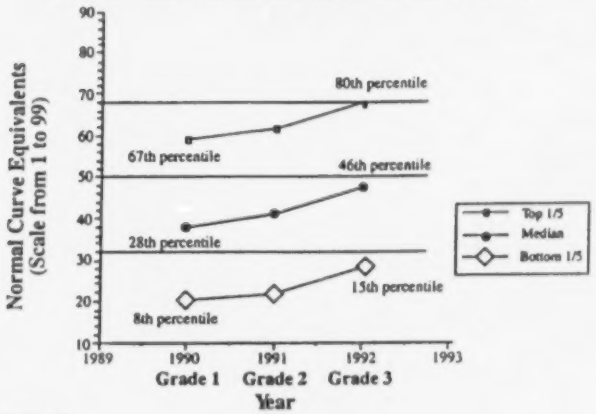

Figure 43
Armatage CAT Reading Comprehension 1990-92
Continuous Membership N=79
(plot of NCEs with national percentile change noted)

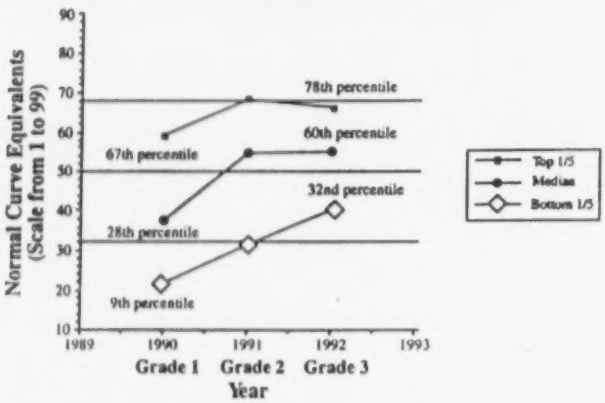

Figure 44
Cooper CAT Reading Comprehension 1990-92
Continuous Membership N=44
(plot of NCEs with national percentile change noted)

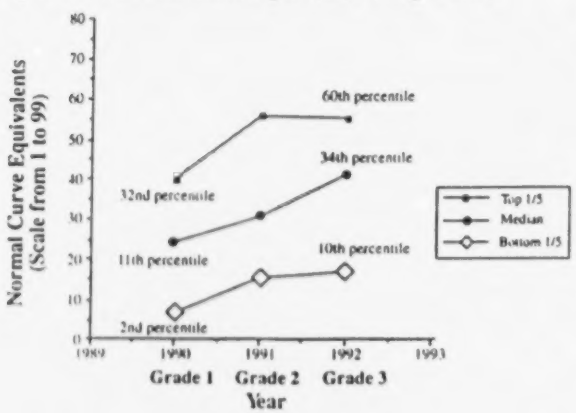

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Figure 45

Hale CAT Reading Comprehension 1990-92
Continuous Membership N=154
(plot of NCEs with national percentile change noted)

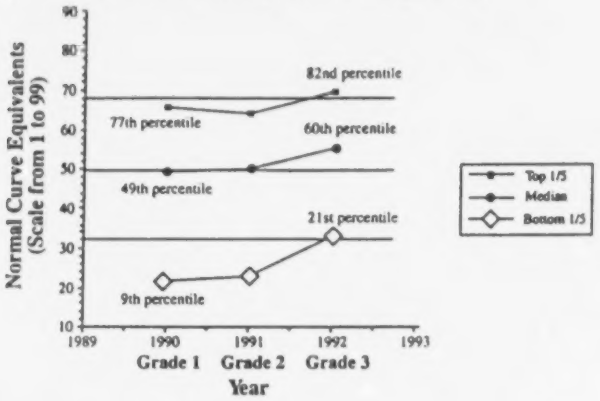

Figure 46

Hiawatha CAT Reading Comprehension 1990-92
Continuous Membership N=50
(plot of NCEs with national percentile change noted)

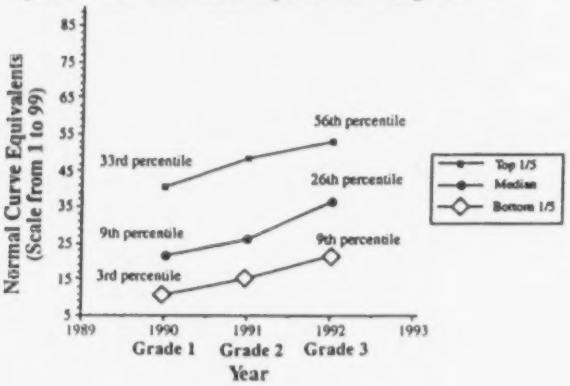

Figure 47

Howe CAT Reading Comprehension 1990-92
Continuous Membership N=54
(plot of NCEs with national percentile change noted)

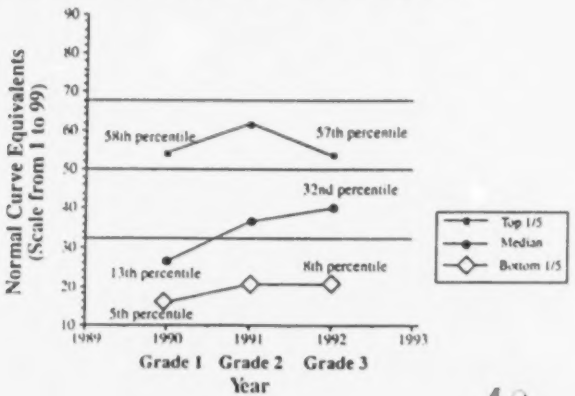

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Figure 48
Keewaydin CAT Reading Comprehension 1990-92
Continuous Membership N=49
(plot of NCEs with national percentile change noted)

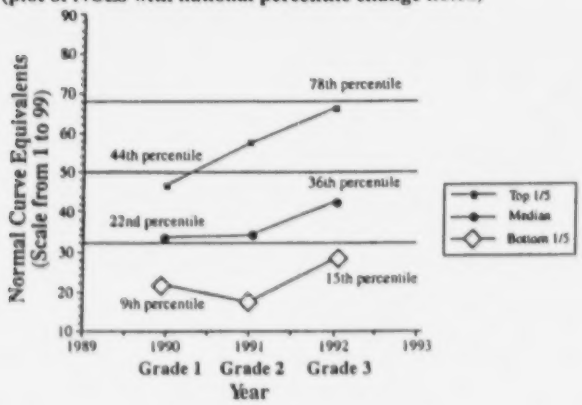

Figure 49
Kenny CAT Reading Comprehension 1990-92
Continuous Membership N=68
(plot of NCEs with national percentile change noted)

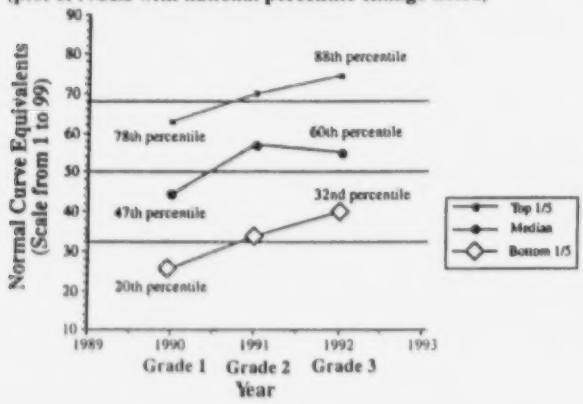

Figure 50
Loring CAT Reading Comprehension 1990-92
Continuous Membership N=57
(plot of NCEs with national percentile change noted)

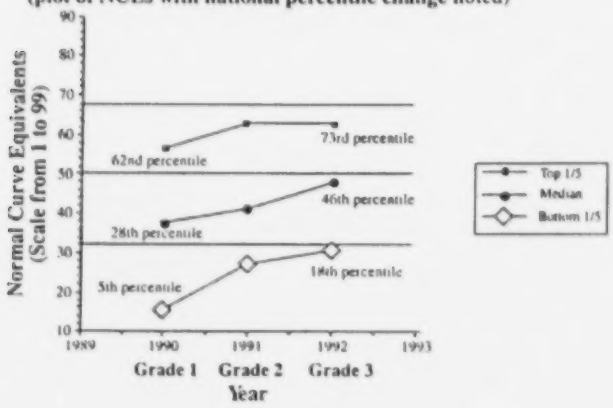

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Figure 51
Morris Park CAT Reading Comprehension 1990-92
Continuous Membership N=69
(plot of NCEs with national percentile change noted)

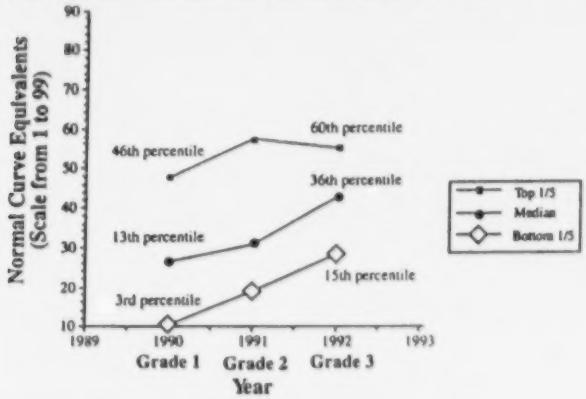


Figure 52
North Star CAT Reading Comprehension 1990-92
Continuous Membership N=58
(plot of NCEs with national percentile change noted)

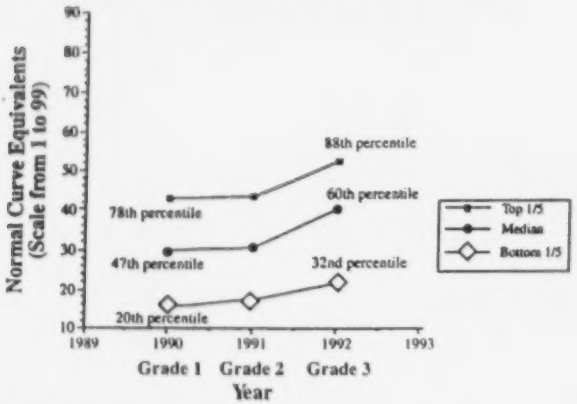
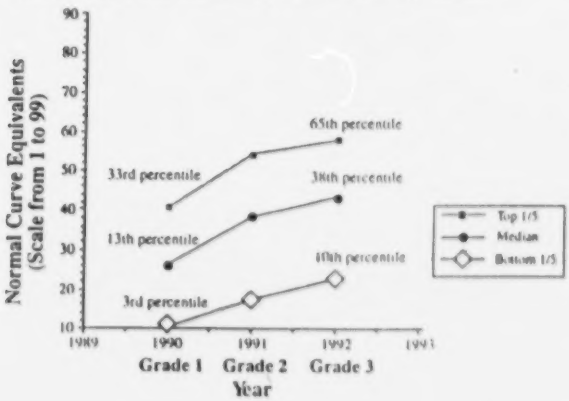


Figure 53
Wenonah CAT Reading Comprehension 1990-92
Continuous Membership N=54
(plot of NCEs with national percentile change noted)



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Appendix C
Reading Graphs for Grades 4-6 Schools
1990-92

Figure 54

MPS 4-6 Elementary School CAT Reading Comprehension 1990-92
Continuous Membership N=2,383
(plot of NCEs with national percentile change noted)

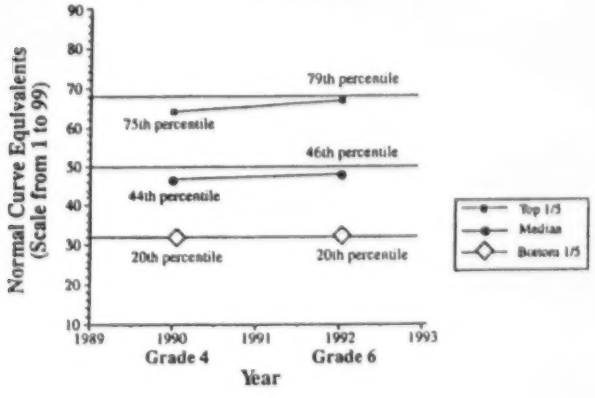

Figure 55

Andersen Contemporary CAT Reading Comprehension 1990-92
Continuous Membership N= 68
(plot of NCEs with national percentile change noted)

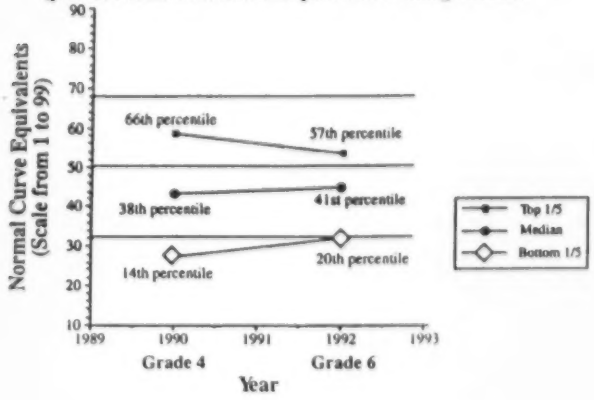

Figure 56

Bancroft CAT Reading Comprehension 1990-92
Continuous Membership N= 91
(plot of NCEs with national percentile change noted)

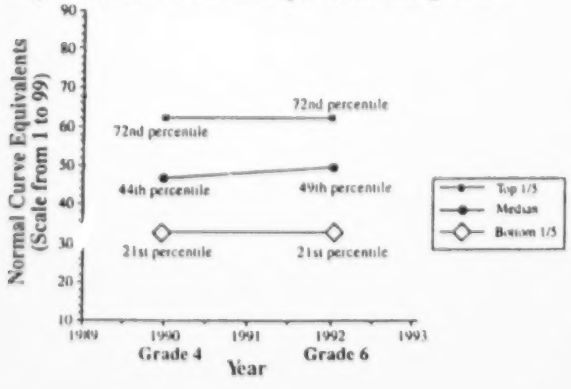

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Figure 57
Field CAT Reading Comprehension 1990-92
Continuous Membership N=131
(plot of NCEs with national percentile change noted)

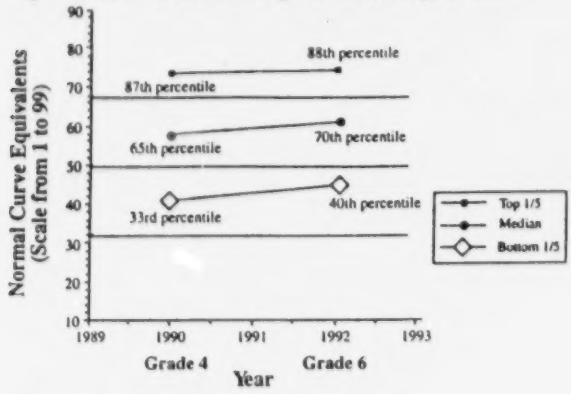

Figure 58
Wilder Contemporary Reading Comprehension 1990-92
Continuous Membership N=158
(plot of NCEs with national percentile change noted)

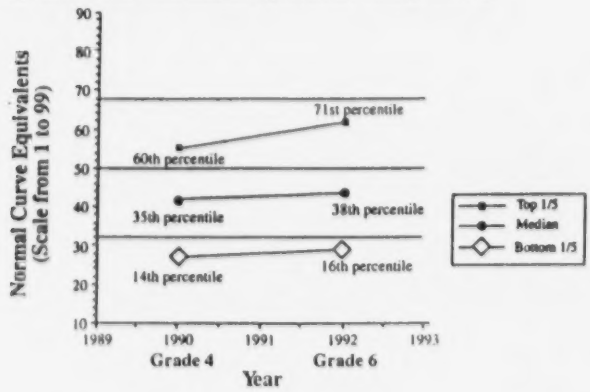

Figure 59
Holland CAT Reading Comprehension 1990-92
Continuous Membership N=158
(plot of NCEs with national percentile change noted)

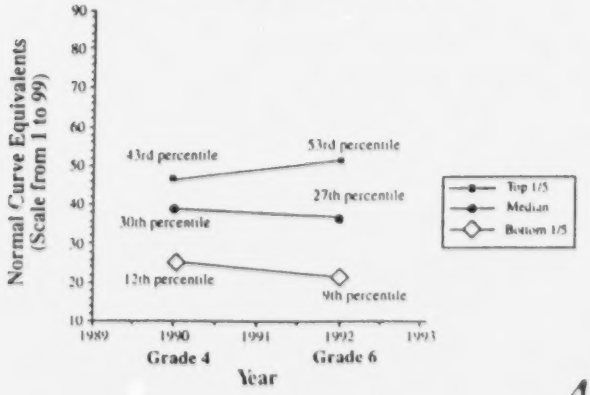

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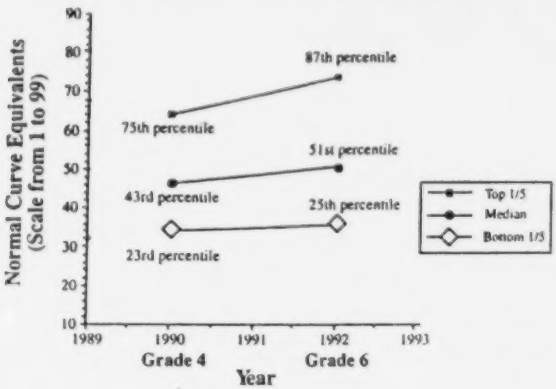
Figure 60

Lyndale CAT Reading Comprehension 1990-92
Continuous Membership N=158
(plot of NCEs with national percentile change noted)



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The National Center on Education in the Inner Cities

The National Center on Education in the Inner Cities (CEIC) was established on November 1, 1990 by the Temple University Center for Research in Human Development and Education (CRHDE) in collaboration with the University of Illinois at Chicago and the University of Houston. CEIC is guided by a mission to conduct a program of research and development that seeks to improve the capacity for education in the inner cities.

A major premise of the work of CEIC is that the challenges facing today's children, youth, and families stem from a variety of political and health pressures; their solutions are by nature complex and require long-term programs of study that apply knowledge and expertise from many disciplines and professions. While not forgetting for a moment the risks, complexity, and history of the urban plight, CEIC aims to build on the resilience and "positives" of inner-city life in a program of research and development that takes bold steps to address the question, "What conditions are required to cause massive improvements in the learning and achievement of children and youth in this nation's inner cities?" This question provides the framework for the intersection of various CEIC projects/studies into a coherent program of research and development.

Grounded in theory, research, and practical know-how, the interdisciplinary teams of CEIC researchers engage in studies of exemplary practices as well as primary research that includes longitudinal studies and field-based experiments. CEIC is organized into four programs: three research and development programs and a program for dissemination and utilization. The first research and development program focuses on the *family* as an agent in the education process; the second concentrates on the *school* and factors that foster student resilience and learning success; the third addresses the *community* and its relevance to improving educational outcomes in inner cities. The focus of the *dissemination and utilization* program is not only to ensure that CEIC's findings are known, but also to create a crucible in which the Center's work is shaped by feedback from the field to maximize its usefulness in promoting the educational success of inner-city children, youth, and families.

CEIC Senior Associates

Margaret C. Wang
Director, CEIC and CRHDE
Professor of Educational Psychology
Temple University

Aquiles Iglesias, Associate Director, CEIC
Associate Professor and Chair,
Speech-Language-Hearing
Temple University

Lascelles Anderson
Professor and Director,
Center for Urban
Educational Research and
Development
University of Illinois
at Chicago

David Bartelt
Associate Professor of
Geography and Urban
Studies and Director,
Institute for Public
Policy Studies
Temple University

William Boyd
Professor of Education
Pennsylvania State
University

Gayle Dakof
Visiting Assistant
Professor of
Counseling Psychology
Temple University

H. Jerome Freiberg
Professor of Curriculum
and Instruction
University of Houston

Michael Goetz
Associate Professor
of Economics
Temple University

Geneva Haertel
Senior Research Associate
CRHDE
Temple University

Howard Liddle
Professor of Counseling
Psychology
Temple University

Maynard C. Reynolds
Professor Emeritus of
Educational Psychology
University of Minnesota

Leo Rigsby
Associate Professor
of Sociology
Temple University

Judith Stull
Associate Professor of
Sociology
La Salle University

William Stull
Professor and Chair,
Department of Economics
Temple University

Ronald Taylor
Associate Professor of
Psychology
Temple University

Herbert J. Walberg
Research Professor
of Education
University of Illinois
at Chicago

Hersholt C. Waxman
Associate Dean for
Research and Associate
Professor of Curriculum
and Instruction
University of Houston

Kenneth Wong
Associate Professor
Department of Education
and Social Sciences
University of Chicago

William Yancey
Professor of Sociology
Temple University

Andrea Zetlin
Associate Professor
Special Education
California State
University, Los Angeles

For more information, contact Jesse R. Shafer, Information Services Coordinator (215/204-3000)